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## DIRECTION OF AGGRESSION AND ADAPTATION TO FREE OPERANT AVOIDANCE CONDITIONING<sup>1</sup>

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26 male medical and graduate students completed the Rosenzweig Picture-Frustration (P-F) Study and the Rod and Frame Test (RFT) and underwent an operant avoidance conditioning situation in which elimination of shock could be achieved by learning a button-pressing schedule. Learners were significantly higher in extrapunitiveness and lower in impunitiveness and conformity than nonlearners; they also reported more aggressive feeling on a mood adjective check list. No differences on the RFT were found. The results are compared with other literature suggesting that persons who can express anger achieve more than those who deny anger or minimize frustrating situations. The P-F may have untapped predictive potential in situations of adaptation.

Previous papers (Ader & Tatum, 1961, 1963) describe the performance of human subjects in a free operant avoidance conditioning situation similar to that developed for use with animals (Brady, Porter, Conrad, & Mason, 1958; Sidman, 1953). In this situation the subject, with electrodes strapped to his leg, is seated at a table with a button conspicuously within his reach. Virtually no instructions are given. Shock is then administered at regular intervals (the shock-shock interval—S-S), but the shock can be delayed for a fixed interval (response-shock inter-

val—R-S) by a button press. The previous work has found considerable variability in response to this situation. Some subjects fail to learn, or at least to execute, a button-pressing schedule which eliminates shock; of these "nonlearners," some terminate the experiment by removing the electrodes and walking out of the testing room. Among those subjects who learn, time to acquisition is quite varied and seems inversely related to the ratio of the R-S to the S-S interval (Ader & Scibetta, 1964).

The frequency of aggressive comments in post-conditioning interviews with subjects in previous studies suggested that some measure of the typical direction of aggression in persons might re-

<sup>1</sup> Portions of this paper were presented at the 1964 meeting of the Eastern Psychological Association in Philadelphia.

late to their mode of adaptation in the conditioning situation. Also suggestive in this regard were subjects' changes in aggression scores on a Mood Adjective Check List devised by Green and Nowlis (1957) to measure affect change as a function of interpolated activity. The specific nature of the interview comments, which often involved direct expression of anger toward the experimenters or toward the self for not having more quickly grasped the solution, led to the use of the Rosenzweig Picture-Frustration (P-F) Study in this experiment. Additionally, diverse reports by subjects of the degree to which their behavior was influenced either by the actual physical situation, particularly with reference to the presence of the button, or by their own cognitive structuring of the experience, suggested inclusion of the Rod and Frame Test (RFT; Witkin, Dyk, Faterson, Goodenough, & Karp, 1962) as a measure of field dependence-independence.

#### PROCEDURE

Subjects for this study were 26 male medical and graduate students, age 24-30, who responded to a general request for paid volunteers. They were tested in two experimental sessions a week apart. In Session I they were interviewed briefly to acquaint them generally with the experimenters and the procedures to follow. They were then given the Mood Adjective Check List (MACL), personal history data were collected, and the Rosenzweig P-F and the RFT were administered. At the end of the session a second response to the MACL was elicited.

In Session II the subject first completed a MACL and then was presented with the conditioning situation. He was told he was to be taken to another room and seated in a chair with electrodes attached to his leg. He was instructed that he was not to get up from or move the chair, nor was he to touch the electrodes. He was asked not to smoke or talk, and he was told the experimenter would be in the next room. At no time was he told anything of the nature of the experiment. The subject was then taken to a small, virtually bare room and seated in front of a table. A red button on a wooden board was fastened to the edge of the table, directly in front of the subject. Electric current, set at that intensity which evoked an involuntary leg flexion, was administered through EKG-type electrodes affixed to the calf of the subject's left leg. The shock was typically described as "unpleasant," "bothersome," or "uncomfortable." Apparatus controlling the conditioning regimen was located in an adjoining room from which observation through a one-way mirror was possible. The experimenter also made the following statement:

This part of the experiment will last from 10 minutes to three hours. This is not an endurance task, and your performance in this situation will not determine the duration of the session.

After the conditioning subjects were again given the MACL and participated in a postconditioning interview, the main purposes of which were to assess their reaction to the situation, deal with anxieties the experience might have aroused, and solicit their cooperation in not revealing the nature of the experiment to other potential subjects. The form of the interview was unstructured, and the only question asked concerning affect was the general inquiry, "What was your reaction to the situation?"

On the basis of their performance in the conditioning situation, 13 subjects were considered learners, 11 nonlearners. The other 2 subjects walked out of the experimental room without completing the session. Since a sample of 2 does not appear to justify assessment of "walkout" behavior, further data will be presented only on the 24 learners and nonlearners. A subject was considered to have learned when he achieved a 5-minute period during which he avoided 80% or more of the shocks he would otherwise have received as a function of his S-S interval. The beginning of this 5-minute period was taken as the time to acquisition. Among the learners, the time to acquisition of the learning criterion ranged from 85 seconds to 44 minutes, with a median of 5.75 minutes. Of the 11 nonlearners, 10 had sat an entire hour, receiving repetitive shocks from 5- to 30-second intervals, without pressing the button; the other nonlearner pressed, but did not learn the pressing response to the acquisition criterion. Failure to acquire the button-pressing response was not associated with any of the temporal parameters of the conditioning situation. Available scores on the Medical College Admissions Test for 10 of the learners and 6 of the nonlearners did not indicate any significant differences in intelligence between the groups.

#### RESULTS

Table 1 presents the mean percentage scores on the Rosenzweig P-F categories for the learner and nonlearner groups. There are highly significant differences between the groups on two of the three categories which pertain to direction of

TABLE 1  
MEAN ROSENZWEIG P-F SCORES OF LEARNERS  
AND NONLEARNERS

Rosenzweig category	Learners ( <i>n</i> = 13)	Non- learners ( <i>n</i> = 11)	<i>SE</i> diff.	<i>t</i>
Extrapunitiveness	51.7	36.1	3.16	4.94**
Intropunitiveness	24.7	28.6	2.77	1.41
Impunitiveness	24.3	35.0	2.93	3.65**
Obstacle-				
Dominance	21.2	18.8	2.01	1.19
Ego-defensiveness	50.8	51.5	3.55	<1
Need-persistence	27.9	30.1	3.94	<1
Group conformity ratio	67.2	76.5	4.29	2.22*

\*  $p < .05$ .

\*\*  $p < .01$ .

TABLE 2  
PRE- TO POSTSESSION CHANGES IN  
AGGRESSION ON MACL

Group	Change in aggression			$\chi^2$
	Less	Same	More	
Session I				
Learners	3	5	5	8.69*
Nonlearners	7	3	0	
Session II				
Learners	2	5	6	<1
Nonlearners	2	2	6	

\*  $p < .02$ .

aggression: extrapunitiveness, in which frustration-induced aggression is turned onto the environment, and impunitiveness, in which aggression is evaded in an attempt to gloss over the frustration. As measured by the P-F, the learner is generally more likely to externalize blame in a frustrating situation, the nonlearner more likely to deny the existence either of blame or of the frustration itself.

No significant differences occurred between the two experimental groups in the three categories of reaction type, obstacle-dominance, ego-defensiveness, and need-persistence. However, an additional significant finding appears in the group conformity ratio, with the nonlearners more frequently than the learners endorsing conventional modes of response on the P-F.

Table 2 lists the changes in aggression on the MACL for the two groups. Aggression is one of the four factors which have been most consistently identified in studies of the MACL and is scored from the adjectives *angry*, *bold*, *defiant*, and *rebellious* on the basis of their high factor loadings (Nowlis, 1960). It may be seen that the learner and nonlearner groups did not differ in aggression change during Session II, the conditioning session, in which subjects had varying experiences. However, learning was significantly associated with a subject's tendency to maintain or increase his level of aggression during the interviewing and testing of Session I a week earlier, in which the experience for all subjects was basically the same. In fact, all five of those subjects whose aggressive feelings increased during Session I learned. This significant finding is enhanced by a closer look at those three subjects who learned in spite of having reported a decrease in aggression during Session I. One of these subjects later admitted familiarity with Brady's (1958) work with monkeys. The other two were by far the slowest learners, each requiring more than 40 minutes to achieve the ac-

quisition criterion and coming close to being classed as nonlearners.

Scores on the other three MACL factors most consistently identified—concentration, deactivation, and social affection—were not found to be associated with learning in any systematic way. On the RFT learners had a mean score of 5.57, the nonlearners a mean score of 4.44, and the  $SE_{diff}$  was .8. The resulting  $t$  of 1.41 is not statistically significant.

The manifest content of the postconditioning interviews was grossly analyzed for the presence of aggressive statements. "Aggression" was scored as present when a subject voluntarily stated that he was angry, irritated, annoyed, mad, or aggravated. "Nonaggression" was scored if the subject specifically denied one of these feelings, and no score was given if neither aggression nor its denial was manifest. The aggression, nonaggression, and zero scores were randomly distributed between the learner and nonlearner groups.

#### DISCUSSION

The significant findings in the experiment appear relevant to at least two areas of inference. The first involves the relationship between achievement and the handling of aggression. The behavior of the nonlearner in the conditioning situation represents a less successful level of adaptation than that achieved by the learner. That this statement is more than merely a value judgment of the experimenters is attested to by the manner in which the nonlearners were prone in the postconditioning interview to justify their behavior. Their comments ranged from "I thought it was an endurance test [which the instructions clearly indicated it was not] and the button a panic button for ending the experiment" to "I thought the button was just left over from another experiment and had nothing to do with this one." Inasmuch as the learners were identified as primarily extrapunitive and the nonlearners as impunitive and learners tended to report and nonlearners to deny increased aggressive feelings on the MACL, the data generally support the hypothesis that those individuals who express their anger are more likely to achieve than those who deny either their anger or experiences which provoke it.

Turning to a use of the word *achievement* different from that employed above, it is interesting to note that such a relationship has repeatedly been found in studies of academic achievement. Kirk (1952), summarizing observations on large numbers of college underachievers, states that such people have difficulty expressing hos-

tility. Shaw and Brown (1957) and Shaw and Grubb (1958) report that both high-school and college underachievers have hostile impulses which are not directed into overt behavior. Shaw and Black (1960), using the Rosenzweig P-F, found greater extrapunitive among achievers than underachievers. The present study suggests that the capacity to express anger may promote achievement not only in the specific academic sense, but also as more broadly viewed in relation to adaptation in situations of stress or challenge.

The relationship between conformity and failure to learn was somewhat puzzling to the experimenters. A possible rationale for this relationship may be that those subjects low in conformity were those with sufficient imaginative capacity and behavioral flexibility to conceive and execute the correct solution. However, it cannot be ignored that persons may under different circumstances achieve by conformity as well as by independence, a possibility recognized, for example, in the separate scales for such modes of achievement developed for the California Personality Inventory. The lack of significant findings with the RFT suggests that the subjects' performance in the conditioning situation was independent of their general trends toward field dependence or independence.

The second area of inference to which the present findings are pertinent is the prediction of overt behavior from knowledge of defensive style as reflected in P-F scores. The literature on predicting from the Rosenzweig to overt behavior has not been particularly promising. Albee and Goldman (1950), for example, found no significant correlations between rated aggressive behavior and P-F scores in a patient population, and Mehlman and Whitman (1955) achieved only chance results in comparing P-F scores of college students to their observed performance in contrived situations analogous to several depicted in the test. Actually, however, only a small portion of the Rosenzweig literature has been concerned with such efforts to predict overt behavior. Studies of concurrent, rather than predictive, validity have been popular, the former involving comparisons between known groups and of score changes following presumably induced frustration. No use of the test to predict behavior in a situation similar to that of the current study is known to the authors. In view of the findings here, it may be that the P-F has predictive potential in situations of adaptation which

has not yet been sufficiently explored to demonstrate the value of the test.

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